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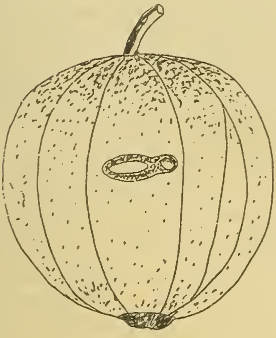
MAINE STATE COLLEGE

AGRICULTURAL EXPERIMENT STATION.

BULLETIN NO. 35. MAY, 1897.

THE CURRANT FLY.

EPOCHRA CANADENSIS,—LOEW.



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THE CURRANT FLY. GOOSEBERRY FRUIT FLY.

Epochra Canadensis, Loew.

ORDER DIPTERA: FAMILY TRYPETIDAE.

BY F. L. HARVEY.

HISTORY AND DISTRIBUTION.

This species was first considered by Loew in 1873, from a single faded female contributed by Osten Sacken. Osten Sacken's material may have come from Maine, as he gives Norway, Maine, as the locality, the specimens having been collected by S. J. Smith. Loew gives Canada as a locality upon the authority of Mr. Provancher. How long the species had been known before it was described does not appear, but Osten Sacken says it "seems to be common in those regions." If its habit of infesting currants was known in 1873, no mention is made of it. It is next considered by Saunders in 1883. During the intervening ten years its currant infesting habit became known and some attempts were made to determine its life history.

In 1891, Prof. Gillette found it very abundant in Colorado, infesting gooseberries, this being the first authentic account of its infesting that fruit. Prof. Gillette also added many facts regarding the life history.

We find no reference to this insect in the Agricultural and Horticultural Reports of Maine, and if it has done injury heretofore it has not been recorded.

Mr. Z. A. Gilbert says he was formerly troubled by such an insect, but stopped growing currants for a time and then resumed and has not been troubled since. Mr. D. H. Knowlton, Farmington, says his currants have been infested for several years.

It is quite certain that *Epochra Canadensis*, Loew, is a native American species, distributed throughout the northern part of the United States, and in Canada, extending from the Atlantic to the Pacific coast.

This insect is widely distributed in Maine and is capable of doing great injury to currants and gooseberries and growers of these berries should become acquainted with it and be on the lookout for its depredations.

GENERAL DESCRIPTION.

Perfect insect a two-winged fly about the size of a house fly. Pale yellow or orange with greenish iridescent eyes and dark bands across the wings. Found about currant and gooseberry bushes from the last of May and through June in Maine. Stings the currants, depositing an egg under the skin, that hatches and develops into a small white maggot causing the fruit to turn red and drop prematurely. The maggots when grown leave the fallen or hanging fruit, enter the ground, change to the pupa state from which the fly emerges the following June.

LIFE HISTORY.

The flies emerge the last of May or early in June, depending on the season and location of the bushes. The time of emergence extends over about three weeks. The flies live about a month. They mate soon after they emerge and begin laying eggs, selecting the larger currants at the base of the bunches first and depositing eggs in the others as they attain sufficient size until the eggs are all deposited. It often happens that several currants at the ends of the bunches are not affected and later develop good fruit. Usually only one egg is laid in a currant. The flies are capable of laying at least two hundred eggs and as they live only about a month must lay several every day. The fly when about to lay an egg lights on the currant and in a nervous, restless manner keeps the wings in a constant fanning motion. She often examines several currants before finding one to her fancy. Usually one of the large currants in the upper part of a bunch that is in the shade is selected. The eggs are laid one in a place at one side of the puncture made by the ovipositor and so close to the skin of the currant that they can usually be plainly seen through it. The eggs are opalescent, white, oblong and pedicilate and about one twenty-fifth of an inch long. They soon hatch into a white footless maggot with thirteen segments to the body, the head armed with a pair of black parallel retractile hooks, the rasping organs of the maggot. The larva requires about three weeks to mature, when it is about one-fourth to one-third of an inch long.

When hatched the larva is about one-twenty-fifth of an inch long and as soon as it emerges from the egg begins to travel, often leaving a delicate light colored trail close under the skin which can be seen through it. After traversing from a third to a half the distance around the currant it locates, entering in most cases one of the seeds, disappearing entirely within it. Sometimes the larva locates near the puncture and sometimes the exit hole is on the opposite cheek from the puncture. As it grows the head finally protrudes from the seed as shown in the Plate, Fig. 7. After feeding upon the contents of a seed and having grown too large to find lodgment within it, it locates between the seeds in the pulp and then gnaws holes in the seeds, eating the contents of one after another until often half a dozen are consumed before the larva is grown. It seems to reject the coats and the clear gelatinous envelope that surrounds the seeds. The refuse of the seeds eaten turns black and becomes cemented together. A black spot becomes visible through the skin. The location of the larva can be told readily as the currant infested soon begins to show a clouded appearance where it is located and finally turns red and a black spot appears. Infested fruits ripen earlier. Often a half grown larva will be found with the head end half buried in a seed. Finally when full fed the larva gnaws to the surface and cuts a circular hole with ragged edges through the epidermis by means of which it emerges.

The larvae often leave the fruit before it drops, but fully half or more are still in the currants when they fall and remain there a greater or less time. The currants often drop before the maggots are mature. When ready to transform, they leave the currants, enter the ground under the bushes, usually less than an inch, shorten up and assume the pupa stage in which they remain, gradually transforming into the fly, until the following spring when they appear, there being but a single brood.

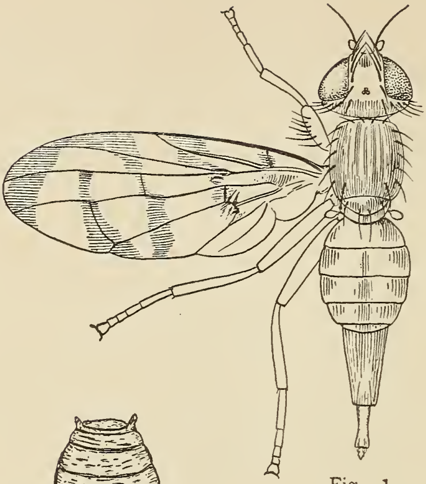

Fig. 1.

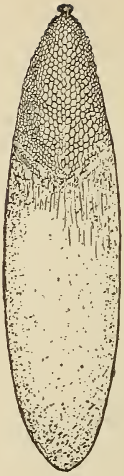

Fig. 2.

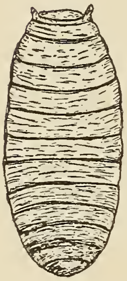

Fig. 4.

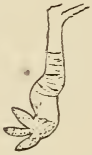

Fig. 5.

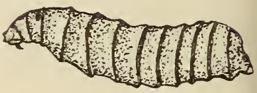

Fig. 3.

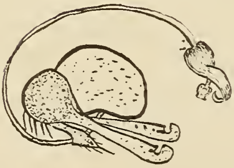

Fig. 8.

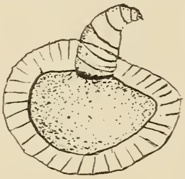

Fig. 7.

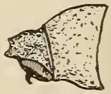

Fig. 6.

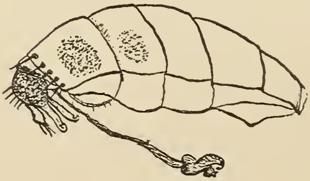

Fig. 10.

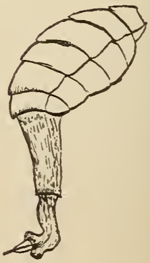

Fig. 9.

The Currant Fly, Gooseberry Fruit-Fly.
(*Epochra Canadensis, Loew.*)

EXPLANATION OF PLATE I—THE CURRANT FLY.

(*Epochra Canadensis*, Loew.)

All excepting Figure 1 were drawn by the writer.

Figure 1. The female fly enlarged about seven and a half times. Drawn by Mr. J. H. Emerton from slides of the wing and ovipositor prepared by the writer and from pinned flies. The two basal joints of the abdomen are drawn as one. The real number, including the long terminal segment is seven instead of six.

Figure 2. Egg showing form, sculpture and pedicel, enlarged fifty times.

Figure 3. The larva enlarged about five times.

Figure 4. The pupa enlarged eight times.

Figure 5. The caudal spiracle of the larva much enlarged.

Figure 6. First two segments of the head showing the tubercles on the head, the rugose mouth and the rasping organs. Enlarged twenty-five times.

Figure 7. Seed of currant with gelatinous envelope showing larva protruding from it. Enlarged.

Figure 8. External genitalia of male. Enlarged twenty times.

Figure 9. Side view of abdomen of female with ovipositor protruding and bent backward in the position it takes as the egg is deposited under the skin to one side of the puncture. Enlarged.

Figure 10. Abdomen of male with gentalia and showing six segments. Enlarged.

REMEDIES.

We have had no experience with this insect as it is new to Maine as an injurious species. From a study of its life history we discover only one vulnerable point. The insect spends nearly eleven months of the year in the ground. In the winged stage it cannot be destroyed so far as we know. The eggs are deposited under the skin of the fruit and spraying would do no good. Part of the infested fruits drop prematurely and the worms remain in them for some time before they emerge and go into the ground. Based upon this last habit we would recommend gathering the fallen currants frequently and burning them. This remedy cannot be relied upon to destroy *all* the flies as quite a number of maggots leave the fruit before it falls. It can be depended upon to destroy fully half if not more and can be employed to keep them in check.

Our western correspondent, Dr. W. A. Thornton, thinks that allowing young chickens about the bushes early in the season and large fowls later after the fruit is gathered will keep them in check.

As the pupae are found only about an inch below the surface, they could be destroyed with little trouble by removing the soil to that depth from under the bushes and burying it deep or depositing it on a road or some exposed place.

Deep spading and turning to bury the pupae, or stirring the surface of the soil after cold weather so as to expose the pupae are methods worth trying.

As these flies are weak and liable to perish if any obstruction is offered to prevent their coming out of the ground, we would recommend a mulching of coarse straw or hay, several inches deep, placed under the bushes and out as far as the branches extend, and well packed.

The maggots are footless and unable to crawl much. Taking advantage of this fact we intend to try this season putting a receptacle under the bushes to catch the falling maggots and infested currants when they fall. A cheap grade of tar paper will be used. Strips will be placed each side of the row and fitted closely where they meet, and an inch cleat tacked along the outer and upper edge and at the ends. The paper will slope away from the bushes. It can be made in sections and stored for use a second season. It should be put under the bushes about June 15th and remain until the worms all leave the fruit, or about August 1st, when the fallen fruit and pupae in the receptacles should be carefully collected and burned. But few of the maggots could escape this treatment.

We have not discovered any parasites to help check the pest. Short bearing years would tend to reduce the numbers.